

CLAIMS

We claim:

1. A method of cleaning containers containing chemicals comprising:
providing a container having a quantity of a chemical contained therein;
providing an input gas;
injecting the input gas into the container via a first valve to form a
chemical/input gas mixture within the container;
removing the chemical/input gas mixture from the container; and
disposing of the chemical/input gas mixture.
2. The method of claim 1 further comprising the step of:
removing the chemical/input gas mixture from the container via a vacuum
pump.
3. The method of claim 2 further comprising the step of:
removing the chemical from the container via the vacuum pump prior to
injecting the heated input gas into the container.
4. The method of claim 1 wherein the container is a rail tank car.
5. The method of claim 1 wherein the container is pressurized.
6. The method of claim 1 further comprising the step of:
heating the input gas prior to injecting the input gas into the container.
7. The method of claim 1 further comprising the step of:
heating the input gas to a temperature of between about 100°F and about
300°F prior to injecting the input gas into the pressurized container.
8. The method of claim 1 further comprising the steps of:
providing an input pipe attached to the pressurized container via a first valve;
providing an output pipe attached to the pressurized container via a second
valve on a first end of the output pipe and a disposal means on a second end of the
output pipe; and
closing the second valve and opening the first valve when injecting the input
gas into the container.
9. The method of claim 8 further comprising the step of:

closing the first valve and opening the second valve when removing the chemical or chemical/input gas mixture via the vacuum pump.

10. The method of claim 1 further comprising the step of:

providing a control means for controlling the injection of the input gas and removal of the chemical/input gas mixture.

11. The method of claim 1 further comprising the steps of:

providing a control means for automatically controlling the injection of the input gas and removal of the chemical/input gas mixture; and

controlling the injection of the heated input gas to the container via the controller.

12. The method of claim 1 further comprising the steps of:

providing a plurality of valves on the container; and

opening up a first valve to inject the container with the heated input gas to form a chemical/input gas mixture.

13. The method of claim 12 further comprising the steps of:

closing the first valve when the container is sufficiently pressurized; and

opening a second valve to remove the chemical/input gas mixture.

14. The method of claim 13 further comprising the step of:

synchronizing the opening and closing of the first and second valves so that the first valve is closed when the second valve is open and the first valve is open when the second valve is closed.

15. The method of claim 1 further comprising the step of:

synchronizing the injection of the heated gas and the removal of the chemical/input gas mixture.

16. The method of claim 14 wherein the synchronization step is performed via a control means.

17. The method of claim 15 wherein the synchronization step is performed via a control means.

18. The method of claim 1 further comprising the steps of:

providing a reaction tank containing a neutralizing material; and

injecting the chemical/input gas mixture into a reaction tank to neutralize the chemical.

19. The method of claim 18 wherein the neutralizing material comprises a caustic solution.

5 20. The method of claim 18 wherein the neutralizing material is selected from the group consisting of sodium hydroxide, potassium hydroxide, sodium carbonate, calcium hydroxide, sodium sulfite, sodium thiosulfite, ferrous chloride and solid bed absorbents.

10 21. The method of claim 18 further comprising the steps of:
pushing the chemical/input gas mixture through the reaction tank; and
reacting the chemical with the neutralizing material to form a salt.